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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
| 10/675,992 | 10/02/2003 | Bamdad Bahar | 0769-4582US6 | 7795 |
| 27123 | 7590 | 11/01/2007 | | |
| MORGAN & FINNEGAN, L.L.P. 3 WORLD FINANCIAL CENTER NEW YORK, NY 10281-2101 | | | EXAMINER VETERE, ROBERT A | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1792 | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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|------------------------------|--------------------------------------|-------------------------------------|--|
| Office Action Summary | Application No. 10/675,992 | Applicant(s) BAHAR ET AL. | |
| | Examiner Robert Vetere | Art Unit 1792 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 25-42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 1792

DETAILED ACTION

Examiner's Comments

An amendment was received on 8/16/07 and has been considered in the action and entered into the record.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 25-30, 32-34, 38 and 41-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oka (JP H6-29032, hereinafter '032) in light of Saeki et al. (JP 64-22932, hereinafter '932).

Claims 25, 38, and 42: '032 teaches a method for producing a substantially air occlusive integral composite membrane comprising:

(a) providing a polymeric support having a microstructure of micropores having a thickness of 1 mil (¶¶ 0007,0015); and

(b) applying ion exchange resin solution to each major surface of said polymeric support (¶ 0015); whereby said micropores are sufficiently filled with ion exchange resin to form an air occlusive integral composite membrane (¶ 0015).

With respect to the claim language that the composite membrane of claim 1 has an ionic conductance rate of at least 5.1 μ mhos/min: while '032 is silent as to the ionic conductance rate of its composite membrane, examiner notes that the membrane disclosed in '032 necessarily meets this limitation for the following reasons:

Applicants' claimed invention consists of an expanded polytetrafluoroethylene ("PTFE") member (thickness of no more than 1 mil, a porosity of more than 35% (preferably 70-95%), an average pore diameter of less than 10 microns) which is sufficiently filled with perfluorinated sulfonic acid, and dried at

Art Unit: 1792

140 degrees C. These steps are then repeated until the desired degree of impregnation is achieved, after which, the membrane is then treated with distilled water (see applicants' specification).

In '032, the method disclosed consists of supplying an expanded PTFE member (§ 0015) with a thickness from 10 to 200 microns (0.39-7.87 mils, § 0007), a porosity of 90% (§ 0015), a mean pore size of 1 micron (§ 0015). This expanded PTFE member is sufficiently filled with perfluorinated sulfonic acid (§ 0015) and dried at 140 degrees C (§ 0015). These steps are then repeated until the desired degree of impregnation is achieved (§ 0015), after which the membrane is then treated with purified water (§ 0015). Given the identical properties and methods of fabrication between applicants' claimed invention and the invention disclosed in '032, it necessarily flows that the invention claimed in '032 will have an ionic conductance rate of at least 5.1 μ mhos/min.

What '032 does not explicitly teach, however, is that the ion exchange resin is applied to each of the opposing sides of the polymeric support. '932 teaches a method of filling the pores of a porous polyolefin film with polymeric ion-exchange resin (CIm. 1) wherein the porous film is immersed in the coating solution, thereby coating each of the opposite sides simultaneously (p. 7: lines 30-34) and subsequently removing excess solution (7:30-34). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have coated each of the opposite sides of the membrane simultaneously, as taught by '932, in the method of '032 with the predictable expectation of successfully impregnating the membrane with ion exchange resin.

Claims 26-28: '032 teaches all the limitations of claim 25, as discussed above. It also teaches that step (b) was repeated five times each followed by a drying step (§ 0015).

Claims 29, 30 and 32: '032 teaches all the limitations of claim 25, as discussed above. It also teaches that the polymeric support is expanded PTFE (§§ 0007, 0015, hereinafter "ePTFE"). Examiner notes that while '032 refers to ePTFE as stretched PTFE which is heated in its stretched state, this is the same method that is used to create ePTFE disclosed in US Patent 3,953,566 which is incorporated into applicants' specification as the method used to create the ePTFE claimed by applicants. Also, with respect to claims 29 and 30, ePTFE is a polyolefin and also is a fluorinated polymer.

Art Unit: 1792

Claim 33: '032 teaches all the limitations of claim 25, as discussed above. It also teaches that the ion exchange resin is a perfluorinated sulfonic acid (§ 0015).

Claim 34: '032 teaches all the limitations of claim 25, as discussed above. It also teaches all the limitations of claims 27, 32 and 33, as discussed above.

Claim 41: '032 also teaches that the ion exchange resin content of the porous polymer film is from 1 to 100 g per 1 g of porous film. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 105 USPQ 233, 235 (CCPA 1955). See, also, MPEP § 2144.05. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have optimized the concentration of ion exchange resin in the porous film absent an evidentiary showing that applicants' claimed content of at least 9.81 g per square meter is critical.

2. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over '032 and '932 in light of Friesen et al. (US 4,515,906, hereinafter '906).

Claim 31: '032 teaches all the limitations of claim 25, as discussed above. What it does not teach is that the polymeric support is a chlorinated polymer. '906 teaches a method of impregnating microporous polymeric supports with polymeric ion-exchange materials wherein the polymeric support is polyvinylchloride (Col. 2, lines 58-63). '906 explains that a chlorinated support is used in favor of other polymers (particularly PTFE) because it has chemically active sites for adding ion-exchange groups and therefore is better suited to hold the ion-exchange material during use of the membrane (Col. 1, lines 11-32). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a chlorinated polymeric support, as taught by '906, in the method taught by '032 in order to have produced an ion-exchange membrane with improved infiltration of the ion-exchange material.

3. Claims 35-37 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over '032 in light of '932 and further in light of Branca et al. (US 5,094,895).

Claims 35-37: '032 teaches all the limitations of claim 25 in light of '932, as discussed above. What it does not teach is that the ion exchange resin comprises a surfactant. '895 teaches a method of

Art Unit: 1792

coating a membrane of expanded PTFE with a perfluoro ion exchange polymer (Abst.) comprising Triton X-100 surfactant (Col. 14: lines 30-47). A surfactant is used to aid in the distribution of the ion exchange polymer (12: 4-14), but, for best performance, must be washed away (claimed step of removing; 10:31-59). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a surfactant with a molecular weight greater than 100, such as Triton X-100, as taught by '895, in the method of '032 and '932 in order to have improved the distribution of the ion exchange resin.

Claim 40: '032 teaches all the limitations of claim 25 in light of '932, as discussed above. What it does not teach is that the air occlusive membrane is substantially the same thickness as the polymeric support. '895, however, teaches that the coated ePTFE is restrained so as to prevent shrinkage during coating (14:30-35). Because '032 and '895 both teach a method of coating a polymeric support with an ion exchange resin, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have restrained the membrane, as taught by '895, to prevent shrinkage in the method of '032 and '932 with the predictable expectation of successfully coating the membrane with ion exchange resin.

4. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over '032 in light of '932 and further in light of Mallouk et al. (US 5,082,472).

Claim 39: '032 teaches all the limitations of claim 25 in light of '932, as discussed above. What it does not teach is that the method further comprises boiling the membrane in a swelling agent. '471 teaches a method of coating an ePTFE membrane with perfluoro ion exchange resin (Abst.) wherein the coated membrane is boiled in water and glycerine in order to increase the observed transport rate in the membrane (10: 1-16). Because '472 is silent regarding pressure, one of ordinary skill in the art would assume that the boiling is conducted at 1 atm. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have boiled the membrane in a swelling agent, as taught by '472, in the method of '032 and '932 in order to have increased the transport rate in the membrane.

Art Unit: 1792

Response to Amendment

Applicant's arguments filed 8/16/07 have been fully considered but they are not persuasive. Applicants' argue that Oka and Saeki fail to teach that the ion exchange resin is applied to each of the opposing sides of the membrane. This is found unpersuasive. As detailed above, Saeki does teach that the ion exchange resin is applied to both sides of the membrane.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert Vetere whose telephone number is 571-270-1864. The examiner can normally be reached on Mon-Fri 9-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1792

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Robert Vetere



MICHAEL B. CLEVELAND
SUPERVISORY PATENT EXAMINER